

## ABSTRACT

The thesis entitled “**Total synthesis of quaternary alkaloid-cotarnine; formal synthesis of carbohydrate unit of varitriol and multicomponent construction of novel heterocyclic scaffolds**” has been divided into three chapters.

**Chapter I:** Synthesis of quaternary alkaloid-cotarnine and formal synthesis of carbohydrate unit of varitriol.

This chapter is further divided into two sections.

**Section A:** Synthesis and process route of quaternary alkaloid-cotarnine from 3,4,5-trimethoxy benzaldehyde.

**Section B:** Synthesis of 5-deoxy-2,3-*O*-isopropylidene- $\beta$ -D-allonitrile from D-ribose.

**Chapter II:** Multicomponent construction of novel heterocyclic scaffolds.

This chapter is further divided into three sections.

**Section A:** Synthesis of 1,2,4,5-tetra substituted imidazoles under conventional heating and microwave irradiation.

**Section B:** Synthesis of novel C-linked glycosylated tetra substituted imidazoles.

**Section C:** Synthesis of polyhydroquinolines *via* Hantzsch reaction under solvent-free conditions.

**Chapter III:** Synthesis of 1-amino-1-phenyl butane and 1-chloro-2-methyl-2-propanol.

This chapter is further divided into two sections.

**Section A:** Synthesis of 1-amino-1-phenyl butane from *n*-butyl benzene.

**Section B:** Synthesis of 1-chloro-2-methyl-2-propanol from chloroform and acetone.